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Macroporous natural capsules extracted from Phoenix dactylifera L. spore and their application in oral drugs delivery**Saad M Alshehri and Tansir Ahamad**
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Macroporous natural Sporopollenin Exine Capsules (SEC) were extracted from date palm (*Phoenix dactylifera* L.) and coated by natural polymer composite (carboxymethyl cellulose with epichlorohydrin). The Polymer Coated Exine Capsules (PCEC) was used in in-vitro investigations for controlled delivery of paracetamol. SEC, PCEC and drugs loaded capsules (PCEC-PAR) were characterized by Scanning Electron Microscope (SEM), surface area (BET), Fourier-Transform Infrared (FT-IR), X-ray Diffraction (XRD), Differential Scanning Calorimetry (DSC) and Thermogravimetric Analysis (TGA). The length of SEC was found to be 20–20.5 μm and the pore sized was 50–135 nm, as measured using SEM. The studies revealed that maximum loading of the drug was at pH 6.0 (97.2%, with 50 mg mL⁻¹). The results indicate that by increasing the pH from 1.4 to 7.4, the cumulative release rates of paracetamol in Physiological Buffer Solution (PBS) is more than two times as in Simulated Gastric Fluid (SGF). In addition, the in-vitro toxicity of PCEC against Caco-2 cells was tested by the 3-[4,5-dimethylthiazole-2-yl]-2,5 Diphenyltetrazolium bromide (MTT) assay, and the results revealed that PCEC are biocompatible materials. The overall results encourage further studies on the clinical use of PCEC as drug carriers.

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